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IS : 10595 - 1983

(Reaffirmed 2001)

Indian Standard

**REQUIREMENTS FOR
POWER DRIVEN BUCKET TYPE
SEWER CLEANING MACHINE**

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Indian Standard

REQUIREMENTS FOR POWER DRIVEN BUCKET TYPE SEWER CLEANING MACHINE

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Indian Standard

REQUIREMENTS FOR POWER DRIVEN BUCKET TYPE SEWER CLEANING MACHINE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 22 June 1983, after the draft finalized by the Public Health Engineering Equipment Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 For removing accumulated silt and debris from a sewer, power driven bucket type sewer cleaning machines should be preferred to old methods, such as manual cleaning by rope pulling which are not considered to be hygienically safe. This standard is intended to cover essential features of the machine to serve as a guidance to the manufacturers and the users.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers general requirements of mobile type power driven bucket machine used for cleaning and desilting of sewers with different types of buckets, tools and devices attached, operated by means of wire rope winches.

2. ENGINE POWER

2.1 The supplier shall specify the power of the engine, the speed of the bucket while in operation in sewer and the pull rating.

*Rules for rounding off numerical values (revised).

3. DIMENSIONS

3.1 The overall dimensions of the machines shall be such that they do not cause undue obstructions to traffic and movement on road while in operation.

4. CONSTRUCTION

4.1 The machines shall be provided with winching units powered by diesel engines rated for continuous duty and shall be capable of operation between manholes located at a maximum distance of 100 m.

4.2 Each machine shall be provided with wire rope winding drum carrying 150 m of stranded steel wire rope conforming to IS:2266-1977*.

4.3 The entire length of the wire rope shall be wound on the drum in maximum five layers.

4.4 The running speed of bucket while in operation in sewer shall be in the range of 10 to 35 m/min.

4.5 Two machines along with all rigging accessories, wire ropes, buckets, necessary tools and tackles shall constitute one set. List of accessories required for a typical set is given at Appendix A. Other accessories and special features may be provided depending upon the agreement between the purchaser and the manufacturer. Two machines constituting the set shall be located at opposite manholes. Fig. 1 and 2 give the general arrangements of machines, one with unloading silt directly on the floor and the other on the truck loader.

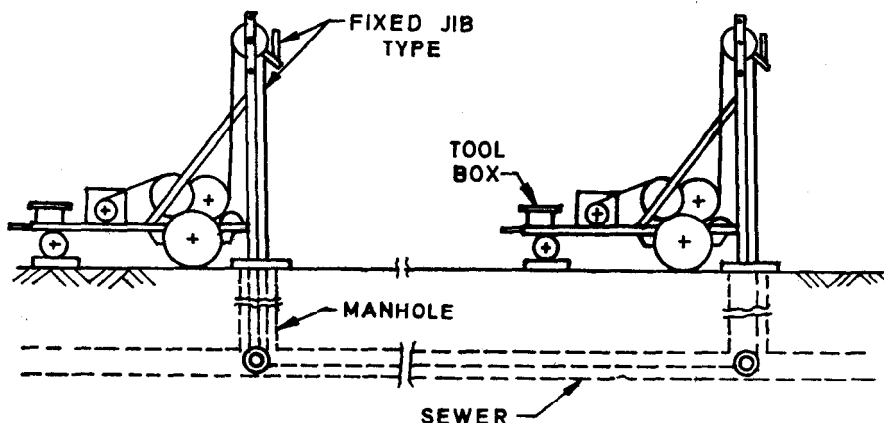


FIG. 1 TYPICAL ARRANGEMENT FOR PLACEMENT OF MACHINES ON MANHOLES (UNLOADING OF SILT DIRECTLY ON FLOOR)

*Specification for steel wire ropes for general engineering purposes (*second revision*).

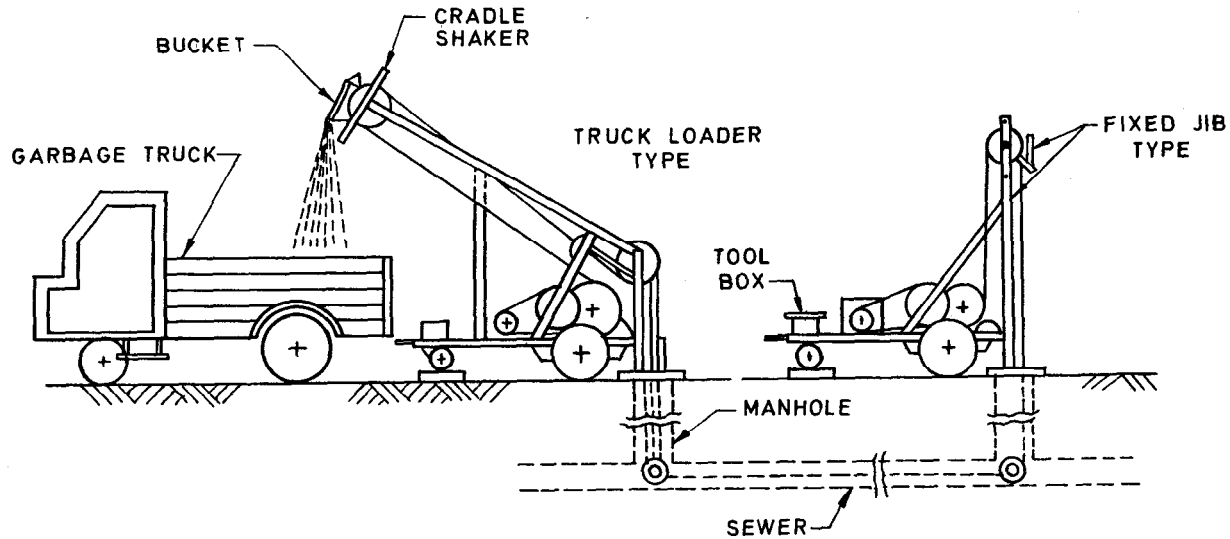


FIG. 2 TYPICAL ARRANGEMENT FOR PLACEMENT OF MACHINES ON MANHOLES (TRUCK LOADER TYPE)

4.6 These machines may be mounted on a single axle two wheel trailer provided with stabilizing third wheel. The main carrying wheels shall be of pneumatic type. The stabilizing wheel may be pneumatic or solid cushion type or a plain steel wheel depending upon the manufacturer's design. The trailer shall be provided with over riding brakes.

4.7 This standard does not preclude the use of machines with a self-powered chassis.

4.8 The device for arranging uniform winding of the wire rope layers on the machine drum shall be included.

4.9 The engine shall be capable of being clutched/declutched from the winch drive. Clutch shall also be provided to engage/disengage the drive to the main winding drum of the machine.

4.10 Engines used with the machines shall be provided with speed control through a throttle lever. The engine shall be rated for continuous duty 8-12 hours per day (*see* IS: 1603-1960*).

4.11 The machine shall be provided with a hand drive arrangement to be used in emergency in the event of engine failure during operation.

4.12 Each machine shall be provided with adequate number of deflection roller pulleys to enable the bucket to negotiate different bends and also pass into the sewer line smoothly.

4.12.1 The roller pulleys used in the sewer shall be provided with yokes and suspension arrangement for fixing and rigging in position during operation.

4.12.2 The roller pulley design shall be such that different sizes and shapes of buckets shall pass smoothly over them during operation.

4.13 Winding Drum

4.13.1 The winding drum of each machine shall also have a hand operated brake to stop the drum whenever so required.

4.13.2 The wire rope for pulling the bucket provided with main winding drum of the machines shall be galvanized round strand type steel wire rope (*see* IS: 2141-1979 †).

4.13.3 The steel wire rope diameter of the main winding drum of the machine shall be of 12 mm dia conforming to IS: 2266-1977‡.

4.13.4 Each machine shall also be provided with an auxiliary winding drum having a capacity to store 150 metres of 6 mm diameter wire rope.

*Performance of variable-speed internal-combustion engines for automotive purposes.

†Specification for galvanized stay strand (*second revision*).

‡Specification for steel wire ropes for general engineering purposes (*second revision*).

4.13.5 The auxillary drum shall be used to make the initial connection between the two machines at opposite manholes and also for maintaining connections of ropes overnight.

4.13.6 Arrangement shall be provided to engage drive to the auxiliary drum whenever so required.

4.13.7 There shall be a locking arrangement to prevent accidental engagement of drive to the auxiliary drum.

4.14 Stability — The machine shall be fully stable when rigged for operation at manhole site.

4.14.1 The machine shall be provided with a suitable size of pneumatic tyres mounted on axle with leaf spring type suspension for taking shocks when being towed on road.

4.14.2 Forces arising during operation of sewer cleaning shall not be transferred to the wheel axle. Props shall be provided on the machine which shall take all reactions arising during operation at manholes.

4.15 Each machine shall be provided with a tool box of adequate size to store small operating and maintenance tools provided with the machine.

4.16 All the operating controls of the machine shall be conveniently grouped together in easy reach of the operator.

5. FINISH

5.1 Painting and Finishing — All machines shall be suitably cleaned of rust and scale or grease before finishing and painting. The machine shall be treated with one coat of primer paint followed by the two coats of finished paint.

5.2 The shade of the finished paint may be as per manufacturers standard unless otherwise specified by the customer.

6. ACCESSORIES

6.1 The purchaser shall specify the list of various accessories and tools required to be supplied with the machine (*see Appendix A*).

6.2 Each machine shall be provided with a lubrication diagram clearly identifying the points requiring lubrication and the type of lubricants to be used. The frequency of lubrication shall also be indicated.

6.3 Users handbook showing the correct use and installation of the machine and all its accessories shall be included as part of the supply with each machine.

APPENDIX A

(*Clauses 4.5 and 6.1*)

ACCESSORIES FOR TYPICAL POWER DRIVEN BUCKET TYPE SEWER CLEANING MACHINE

A-1. ACCESSORIES

A-1.1 The following accessories are required for a typical set of power driven bucket type sewer cleaning machine:

- a) 150 metres of 12 mm dia stranded steel wire rope conforming to IS: 2266-1977*,
- b) 150 metres of 6 mm dia stranded steel wire rope conforming to IS: 3459-1977†,
- c) Swivel shackles of forged steel conforming to IS: 3445-1966‡, construction used with D shackles—2 No.,
- d) Slant manhole jack—1 No.,
- e) D shackles—2 No.,
- f) Bulldog grips suitable for 12 mm wire rope—6 No.,
- g) Surface platform complete with pipe clamps—2 No.,
- h) 375 mm rollers with frame fitted with 2 screwed jacks—2 No.,
- j) 300 mm rollers with frame and pipe—2 No.,
- k) Large handhook—1 No.,
- m) Emergency handle—2 No.,
- n) Winch buckets for 150, 200, 250 and 300 mm conforming to IS: 10552-1983§,
- p) A float ball with 150 m rope,
- q) Collapsible scraper, and
- r) Pull through wire brush.

*Specification for steel wire ropes for general engineering purposes (*second revision*).

†Specification for small wire ropes (*first revision*).

‡Specification for forged steel rolls.

§Specification for buckets to be used in power driven type sewer cleaning machine.

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	1 N = 1 kg. m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²